## **REMARKS**

The following remarks address the issues raised by the Examiner in the Office Action of July 22, 2004:

In response to item 4 ("errors of which applicant may become aware in the specification"), applicants have amended the first sentence after the subtitle "Summary or the Invention" to avoid the confusing phraseology "An objective ....that meets the foregoing objective ....".

In response to items 5 a) 1 (objection to summary because it contains numerous details) and 5 a) 2 (objection to summary because it refers to prior art published in the US and in foreign countries), applicants propose to divide the existing Summary of the Invention into two parts, i.e.,:

- 1. a shortened **Summary of the Invention**, ending after "....despite a good Petzval correction" on page 12, line 21 of the specification, followed by
- 2. a **Detailed Conceptual Description of Preferred Embodiments** containing the rest of the existing Summary of the Invention.

The shortened Summary of the Invention contains the part that relates to claim 1, while the Detailed Conceptual Description of Preferred Embodiments relates to the rest of the claims. Applicants respectfully submit that this represents a simple and expedient solution to make the Summary of the Invention simpler and shorter and to remove the references to the US and foreign prior art from the Summary.

The objections 5 b) to 5 f) have been corrected by amending the specification in accordance with the Examiner's suggestions.

Claims 1 to 47 are pending in the application, including the four new claims 44-47 presented in the present amendment.

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Applicants appreciate that the Examiner found claims 1 to 28 allowable and have amended claims 16 and 25 in accordance with the Examiner's suggestions to address the informalities mentioned in items 6a) and 6b) of the Office Action. The objections against claims 16 and 25 should therefore be withdrawn.

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Claims 29-30 and 33 stand rejected under 35 U.S.C. 102(b) as being anticipated by Phillips (EP 267 766). The rejection is based on the Examiner's attempt to read claim 29 on a system that is described in the Phillips reference on pages 6 and 7 and shown in Figure 3. Applicants respectfully submit that the Examiner has misinterpreted the Phillips reference, at least by equating the term "magnification" (used by Phillips) to the term "imaging ratio" that is used, e.g., in claim 29 of the present application. The terms "magnification" and "imaging ratio" are defined as follows on page 14, lines 16-22 of the present application:

"In this context, the imaging ratio between two conjugated field planes is defined as the absolute value of the ratio between an object height and an image height, wherein the magnification ratio between two conjugated field planes is defined as the ratio between an image height and an object height, having e.g. a positive sign for an upright image and a negative sign for an inverted image."

Accordingly, the "imaging ratio" as used in the present application is by definition always positive, while the "magnification ratio", likewise based on the definition, can be positive or negative. In addition, and most importantly, the absolute value of the magnification ratio is the reciprocal of the imaging ratio. For example, a magnification ratio of -0.25 correlates to an imaging ratio of  $\left|\frac{1}{-0.25}\right| = 4:1$ . In other words, a large imaging ratio correlates to the formation of a reduced image, while a large magnification ratio correlates to the formation of a magnified image.

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The Examiner refers to the embodiment according to Figure 3 in the Phillips reference. Even from Fig. 3 alone, it is clear that only the first partial objective 72 produces an enlarged image with an imaging ratio smaller than 1:1. This can be concluded from the aperture angles of the light rays shown in Fig. 3. In the case of an image reduction the aperture angle increases, while in the case of an image enlargement the aperture angle decreases. The specific numerical values given in the description corroborate this. The Examiner refers to the description of Figure 3, according to which the first subsystem 72 has a magnification of 5.99, while the second subsystem 74 has a magnification of 2.66. To interpret these numbers correctly, one needs to refer to the general description of this type of objective, which is presented in the context of Figure 2 of EP 0 267 766. According to column 9, lines 29 to 31, this type of objective consists of two catoptric reduction imaging subsystems that are "coupled back to back at their nominal image planes 46 and 48, respectively." Thus, only the first subsystem actually operates as a reduction objective, while the second subsystem, being installed with reverse orientation, operates as a magnifying objective. As disclosed further in column 9, lines 43 to 48, the overall magnification ratio of the objective is the ratio of the magnification of the first subsystem divided by the magnification of the second subsystem. While one would normally expect an overall magnification ratio to be the multiplication product of the subsystem magnification ratios, the unusual way of calculating the overall magnification ratio as the quotient of the subsystem ratios is correct in the case of the Phillips reference for the reason that the second partial objective was installed with reverse orientation, i.e., with the image plane rather than the object plane of the second partial objective being located in the intermediate image.

If the term "imaging ratio" is defined according to the present application, the embodiment according Phillips' Figure 3 has an imaging ratio of 5.99 : 1 (i.e., larger than 1 : 1) for the first partial objective, while the second partial objective has an imaging ratio of 1 : 2.66 which equals a ratio of 0.376 : 1 (i.e., smaller than 1 : 1).

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To conclude the argument, the imaging ratio between the intermediate image plane and the image plane in the embodiment of Fig. 3 of the Phillips reference is smaller than 1, while claim 29 of the present application requires "a second imaging ratio greater than 1: 1 between the intermediate image and the second field plane". Consequently, lacking at least the feature of a second imaging ratio greater than 1: 1, the Phillips reference cited by the Examiner cannot anticipate claim 29 of the present application. The rejection of claim 29 and its dependent claims 30 and 33 should therefore be withdrawn and, since there are no other rejections concerning them, claims 29, 30 and 33 should be allowed.

Claim 37 stands rejected under 35 U.S.C. 102(b) as being anticipated by Flint (US Patent 5,309,541). To address this rejection, applicants propose to amend claim 37 to recite that "the objective produces a diffraction-limited projection". This additional limitation of claim 37 is based on the following paragraph on page 25 of the specification:

In addition to the application as projection objective or as inspection objective, the objective according to the invention can also be used in other optical arrangements where a <u>diffraction-limited projection</u> is to be achieved in conjunction with very large numerical apertures, particularly in the case of EUV wavelengths. Microscopy, in particular, offers a wide field of applications.

No new matter is thereby introduced into the application. In contrast to the objective of claim 37 (as currently amended) of the present application, Flint discloses a light conduit, giving no indication of any attempt at a diffraction-limited image-formation. Applicants respectfully submit that claim 37 as amended herein is patentably distinct from Flint '541 and that the rejection should therefore be withdrawn and claim 37 (as amended herein) should be allowed.

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Applicants appreciate that the Examiner found claims 31, 32, 34-36 and 38-43 to be conditionally allowable, i.e., objected to as being dependent upon a rejected base claim, but allowable if rewritten in dependent form. With regard to claims 31, 32 and 34-36, applicants respectfully submit that they should be allowed without being rewritten, as their base claim 29 should be allowable based on the argument presented above. Claims 38-43 should be allowable because their base claim 37 (as amended herein) should be allowable.

In addition, claims 38 and 40 are presented herein in independent form as claims 44, 47 (new) and should be allowable according to the Examiner's finding. Claims 45, 46 (new) should be allowed as being dependent on claim 44.

In conclusion, applicants respectfully submit that all issues of the Office Action of July 22, 2004 have been addressed and that the pending claims 1-47 have been shown to be allowable based on the present amendment and the foregoing remarks and arguments. Allowance of the application with all of the pending claims 1-47 is respectfully requested.

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